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ABSTRACT

The industrial education program in the Teachers College at the University of Nebraska-Lincoln (UNL) is using a currently established technical training environment available across the state: the state's community colleges. UNL uses the community colleges' technical expertise in two ways. First, traditional on-campus industrial technology education major complete 27 of their 45-semester-hour industrial technology core at Southeast Community College. Second, the industrial education program has established articulation agreements with two other Nebraska community colleges whose students transfer to UNL after completion of an associate degree in industrial technology education. Four criteria used to establish a technical training site for UNL's industrial technology education majors could be used by other programs that wish to establish similar arrangements. First, the course content should meet the needs of the prospective industrial technology education teacher. Second, the community college instructors' educational background should be analyzed for a teacher education emphasis. Third, the commingling of university and community college students in the same classes should be avoided. Fourth, the scheduling of the two different systems can and should be made compatible. Many community colleges have associate degree programs in place that can be adapted into an industrial technology education program. (Sample program materials are appended including an Industrial Technology Planning Guide, a sample letter of argument for the transfer of credit between a community college and a university, and a list of required and elective courses for the Central Community College Associate of Art in Education.) (YLB)

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Community Colleges:

An Untapped Resource For

Industrial Teacher Education

A Research Paper
Presented At
The American Vocational Association
1995 Conference
Denver, Colorado

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by
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The field of industrial education currently has a serious shortage of certified teachers. Institutions that once produced a multitude of industrial arts education teachers have shut their doors. Moreover, since 1980 over 37% of these colleges and universities have closed their industrial teacher education programs (Volk, 1993). Additionally, many of the current teacher preparation programs are on the brink of closing.

There is a direct connection between the closure of these programs and the decline in the number of industrial technology education graduates. The number of students receiving teaching degrees from these programs decreased dramatically between 1970 and 1990, down by over 70%. Between 1990 and 1994, the number of graduates has declined by an additional 48%. According to Dennis (1994), only 939 individuals received industrial technology education teaching degrees last year.

One reason for this national trend is the expense to the college or university in operating an industrial technology teacher education training facility. The funding required to maintain one modern industrial technology laboratory is more that some college of education budgets, and industrial technology education majors need skill preparation in numerous technical areas. Because of the technical diversity

needed by the faculty, it is also difficult for universities to attract and maintain qualified industrial teacher educators.

The Industrial Education Program in the Teachers College at the University of Nebraska-Lincoln (UNL) is currently reversing this national trend. The program's growth, 70% in one year, has not being accomplished by expanding University industrial technology laboratories nor by hiring additional teacher educators. UNL's Industrial Education Program is utilizing a currently established technical training environment available across the state, the state's community colleges.

UNL utilizes the community college's technical expertise in two different methods. First, traditional on-campus industrial technology education majors complete 27 of their 45 semester hour industrial technology core at Southeast Community College. A sample program of study can be seen in Appendix A. This articulation link with the local community college was established in the 1970's and has worked smoothly and effectively for over two decades. Second, the Industrial Education Program has established articulation agreements with two other Nebraska community colleges, Metropolitan Community College (Omaha & Elkhorn) and Central Community College (Grand Island & Hastings). Students from these two school transfer to UNL after completion of an associate degree in industrial technology education.

With the shortage of qualified industrial technology education graduates reaching a critical level, industrial teacher educators need to explore innovative methods of preparing these teachers. This paper will examine criteria that other industrial technology teacher education programs can utilize to assist in establishing similar successful arrangements. According to a survey of the 128 colleges and universities that prepare industrial technology education teachers, only two other universities use any type of link with the community college (Rogers, in press). Neither of these institutions have a contractual transfer agreement with the community colleges they utilize.

By developing formal articulation agreements the nation's community colleges, universities can prepare an adequate number of industrial technology education teachers, thus insuring the survival of this essential pre-vocational program in the nation's junior high and middle schools.

Concurrent Community College Attendance

Four criteria were utilized by UNL when establishing a technical training site for its industrial technology education majors (Edmunds & Buskirk, 1984). These four criteria were; 1) the course content should meet the needs of the prospective industrial technology education teacher; 2) the community

college instructors' educational background should be analyzed for a teacher education emphasis; 3) the co-mingling of university and community college students in the same classes should be avoided; and 4) the scheduling of the two different systems can and should be made compatible.

A mutual consensus of course content should be established between the teacher education institution and the community college. The course content should parallel a course the university would teach on its own campus if facilities, funding, and availability of instructors would allow. The curriculum, in addition to providing technical skill development, should emphasis the preparation of a professional educator and not that of a trades-person.

An investigation must be made into the preparation of the community college instructors responsible for writing and teaching the community college curricula to be utilized by industrial technology education majors. Many community colleges employ industrial educators with baccalaureate and graduate degrees in education. However, when a low number of qualified degreed personnel exists, in-service professional coursework could be provided to assist in bringing the community college instructors up to university expectations.

Arrangements should be made to set aside specific course sections at the community college for university industrial

technology education majors. This is of special importance during the lecture portion of courses, so instructors can emphasize how the industrial technology education majors can teach the technical content to their future industrial technology students. However, during laboratory activities, co-mingling with technical majors should not present any problems and may be beneficial in recruiting community college students into industrial technology education programs.

Scheduling of the two systems requires considerable coordination between the university and the community college. Many community colleges are on the quarter hour system, while universities are on the semester system. A schedule in which the university utilizes Monday, Wednesday, and Friday for its lower division industrial technology education course work and students complete their community college coursework on Tuesday and Thursday has worked extremely well at UNL. The proximity of the community college to the university also has an impact on scheduling. Southeast Community College is six miles from UNL's city campus. This distance has never presented a problem, as the city has an excellent public transportation system which university students can utilized free of charge.

Associate Degree Transfer

Community colleges are generally very receptive when a four year university approaches them to establish an articulation agreement. Just as for the concurrent community college classes, the community college's course content and instructors' educational background should be examined to determine if the industrial technology education majors will be properly prepared.

Typically, community college have associate degrees in education or general college transfer already in place. Adapting these established programs of study into an industrial technology education program proves much easier and involves less administrative procedures than creating a new associate degree program. Most community colleges are surprised that "university" personnel are approaching them because of their "expertise."

The two associate degree transfer agreements established by UNL with Central and Metropolitan Community Colleges entail approximately 30 semester hours of general studies and 30 semester hours of technical coursework. This 50/50 mix has proved to be agreeable to both institutions, plus the students have experienced success on the university campus. The technical hours should be selected to parallel the technical hours a traditional student would complete at the community

college site. The general studies coursework should be checked to insure its transferability to the university's general studies curriculum. (See Appendices B & C)

Conclusion

If industrial teacher educators do not take the leadership in securing innovative means of preparing industrial technology education teachers, the field faces possible extinction. Without this pre-vocational program providing junior high and middle school students with skills to enter high school T&I programs and then articulate to post-secondary technical education, the underlying philosophy of skill-enhanced Tech Prep will be lost.

References

Dennis, E. A. (1994). Industrial Teacher Education Directory, CTTE and NAITTE, Department of Industrial Technology, University of Northern Iowa, Cedar Falls, IA.

Edmunds, N.A. & Buskirk, D. (1984). Technical community colleges: A source of relevant instruction for potential industrial arts teachers. Industrial Education, 73(6), 32-33.

Rogers, G.E. (in press). The technical content of industrial technology teacher education: A reflective examination.

Volk, K. S. (1993). Enrollment trends in industrial arts/ technology teacher education from 1970-1990. Journal of Technology Education, 4(2), 46-59.

Name _____ SS# _____

INDUSTRIAL TECHNOLOGY (7-12)—PLANNING GUIDE

No grade below C allowed in endorsement requirements or professional education courses.
Student must maintain an accumulative GPA of 2.5 (C+) GPA overall and in endorsement requirements.

A. GENERAL EDUCATION REQUIREMENTS (51-62 hrs)

Note: All students are required to complete 3 hrs in multi-cultural perspectives in the U.S. and 3 hrs in • cross-cultural or global perspectives. (See advisor for approved list.)

I. Culture and Society: (12 hrs)
(Limit 6 hrs from one dept.)

U.S. History _____ (3 hrs) _____
• _____ (3 hrs) _____
_____ (3 hrs) _____
_____ (3 hrs) _____

II. Arts and Humanities: (12 hrs)
(Limit 6 hrs from one dept.)

Literature _____ (3 hrs) _____
Fine/Performing Arts _____ (3 hrs) _____
Philosophy (Not logic) _____ (3 hrs) _____
• _____ (3 hrs) _____

III. Science and Technology: (9-10 hrs)
(From at least 2 depts.; one with lab)

_____ (3 hrs) _____
_____ (3 hrs) _____
_____ (4 hrs) _____

IV. Mathematics and Statistics: (6 hrs)

Math 101 or above _____ (3 hrs) _____
_____ (3 hrs) _____

V. Written/Oral Communication: (9-19 hrs)

Written Communication _____ (3 hrs) _____
Written Communication _____ (3 hrs) _____
Oral Communication _____ (3 hrs) _____
Foreign Language _____ (0-10 hrs) _____

VI. Physical and Mental Health: (3 hrs)

Health 100 Healthy Lifestyles _____ (3 hrs) _____

Student Teaching—Apply in Student Services Center by March 1 for fall; October 1 for spring.

05/94
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B. ENDORSEMENT REQUIREMENTS (58 hrs)

VAE 101	Arch Drafting (Fall) _____	(3 hrs)	SCC
VAE 101	Mech Drafting (Fall) _____	(3 hrs)	SCC
VAE 101	CAD Drafting (Spr) _____	(3 hrs)	SCC
VAE 104	Basic Woodworking (Fall) _____	(3 hrs)	UNL
VAE 109	Ind Metals and Plastics (Spr) _____	(3 hrs)	UNL
VAE 201	Electricity/Electronics (Fall) _____	(3 hrs)	SCC
	(Spr) _____	(3 hrs)	SCC
VAE 202	Arc Welding (Fall) _____	(3 hrs)	SCC
VAE 202	OA Welding (Fall) _____	(3 hrs)	SCC
VAE 203	Automotive (Fall) _____	(3 hrs)	SCC
	(Spr) _____	(3 hrs)	SCC
VAE 204	Machine Shop (Spr) _____	(3 hrs)	SCC
VAE 206	Energy & Power Tech (Spr)	(3 hrs)	SCC
VAE 210	Intro to Ind Ed (Fall) _____	(1 hr)	UNL
VAE 242	Const Materials (Fall) _____	(3 hrs)	UNL
VAE 243	Prod Proc of Wood Ind (Spr) (VAE 340 will be taught simultaneously with VAE 243)	(3 hrs)	UNL
VAE 246	Modern Industries (Spr) _____	(3 hrs)	UNL
VAE 247	Industrial Safety (Fall) _____	(3 hrs)	UNL
VAE 322A	Technology Concepts _____	(3 hrs)	UNL
VAE 329	Adv Info Tech (Fall) _____	(3 hrs)	UNL

PROFESSIONAL EDUCATION COURSES (38-40 hrs)

Educ 131 (freshmen) or C&I 331 _____	(3 hrs)	_____
or 431 (sophomores and above)		
EdPsy 261 Fund of Psych for Educ _____	(3 hrs)	_____
EdPsy 297 Practicum _____	(1 hr)	_____
EdPsy 362 Learning Theories _____	(3 hrs)	_____
C&I 330 Multicultural Educ _____	(3 hrs)	_____
VAE 424 Dev of Voc Educ (Fall) _____	(3 hrs)	_____
VAE 434 *Spec Voc Needs (Spr) _____	(3 hrs)	_____
(*MEETS MAINSTREAM REQUIREMENT)		
VAE 440 Lab Planning & Mgmt (Spr) _____	(2 hrs)	_____

ADMISSION TO THE TEACHER EDUCATION PROGRAM IS REQUIRED FOR ENROLLMENT IN ALL 300 LEVEL METHODS COURSES

VAE 318 Compre Voc Curr Devel (Pre-req to VAE 321E) _____	(3 hrs)	_____
VAE 321E Mthds of Tchng Ind Educ (Spr) _____	(4 hrs)	_____

VAE 497M	Stu Teach in Ind Ed _____	(8-10 hrs)	_____
VAE 497Y	Mainstream Experience _____	(1 hr)	_____
VAE 497Z	Multicultural Experience _____	(1 hr)	_____

Vocational approval (occupational experience) is required.
See advisor.

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Industrial Technology Education
Student Planning Guide

ENDORSEMENT REQUIREMENTS (45 hours)

CONSTRUCTION: (9 hours)

VAE 104 Wood Technology (3 hours)	UNL
VAE 242 Construction Technology (3 hours)	UNL
VAE 243 Production Processes of the Wood Industry (3 hours)	UNL

DRAFTING: (9 hours)

VAE 101 Mechanical Drafting (3 hours)	SCC
VAE 205 Architectural Drafting (3 hours)	SCC
VAE 305 Computer-Aided Drafting (3 hours)	SCC

MANUFACTURING: (12 hours)

VAE 109 Industrial Metals and Plastics (3 hours)	UNL
VAE 202 Welding Technology (3 hours)	SCC
VAE 204 Machine Tool Technology (3 hours)	SCC
VAE 246 Modern Industries (3 hours)	UNL

POWER-ENERGY-TRANSPORTATION: (6 hours)

VAE 201 Electricity-Electronics (3 hours)	SCC
VAE 203 Automotive Technology (3 hours)	SCC

INDUSTRIAL EDUCATION ELECTIVES: (9 hours)

VAE ___ _____	_____
VAE ___ _____	_____
VAE ___ _____	_____

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PROFESSIONAL EDUCATION COURSES (40-42 hours)

Educ 131 Foundations of Education (3 hours)	_____
EdPsy 261 Foundations of Ed. Psychology (3 hours)	_____
EdPsy 297 Practicum (1 hour)	_____
EdPsy 362 Learning Theories (3 hours)	_____
C&I 330 Multicultural Education (3 hours)	_____
VAE 210 Introduction to Industrial Education (1 hour)	_____
VAE 424 Development of Vocational Education (3 hours)	_____
VAE 318 Vocational Curriculum Development (3 hours)	_____
VAE 434 Special Vocational Needs (3 hours)	_____
VAE 440 Managing the Industrial Education Laboratory (3 hours)	_____
VAE 321e Methods of Teaching Industrial Education (3 hours)	_____
VAE 297 Practicum (1 hour)	_____
VAE 497 Student Teaching (10-12 hours)	_____

Industrial Technology Education Program

RESOLUTION

WHEREAS, the Bachelor of Science in Education with a Major in Industrial Education offered by the University of Nebraska-Lincoln is not competitive with any degree program offered by any of the two or four year colleges in the Metropolitan Community College Area; and

WHEREAS, the University of Nebraska-Lincoln will accept up to sixty-six semester credit hours from Metropolitan Community College for students with an Associate of Applied Science Degree in Industrial Technology Education who wish to pursue the Bachelor of Science in Education with a Major in Industrial Education; and

WHEREAS, students will be required to complete at Metropolitan Community College: (1) a core of General Studies taken from a General Studies course list approved by both institutions; (2) a minimum of nine quarter hours in each of the following areas: Construction Technology (CST), Manufacturing Drafting and Design (DRT), Industrial Maintenance (IDM), Precision Machine Technology (PMT), Welding and Fabrication Technology (WEL); and (3) one course in each of the following areas: Automotive Technology (AUT) and Graphic Arts (GAT) (PRINTING); and

WHEREAS, cooperation between the colleges will improve service to students and economic efficiency; and

WHEREAS, cooperation and coordination between the colleges are fostered in the Role and Mission of the Legislature, LB 756, 1978; and

WHEREAS, personnel from Metropolitan Community College and the University of Nebraska-Lincoln have met and as a result are enthusiastic about the potential of improved service to the people in the region of Southeast Nebraska.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Governors of the Metropolitan Community College Area in response to the collaboration initiative of Metropolitan Community College and the University of Nebraska-Lincoln, approve the Industrial Technology Education Program leading to the Associate in Applied Science Degree and the transfer of Metropolitan Community College graduates into the University of Nebraska-Lincoln's Bachelor of Science in Education with a Major in Industrial Education.

Board of Governors
October 22, 1991

Industrial Technology Education

Associate in Applied Science Degree
Elkhorn Valley Campus
Fort Omaha Campus
South Omaha Campus

The Industrial Technology Education program offers the student an opportunity to obtain an associate in applied science degree that is transferable as the first two years of the baccalaureate degree in Industrial Education from the University of Nebraska-Lincoln. It provides a portion of the basic general education and vocational courses required of all Industrial Education students at the University of Nebraska-Lincoln.

Metro's Program

Courses in Industrial Technology Education are offered at all of Metro's campuses.

Program Requirements

	Qtr. Hours
General Education Requirements	**43**
ART 100 Survey of Art History	4.5
BIO 101 Introduction to Biology	6
ENG 101 English Composition I	4.5
ENG 102 English Composition II	4.5
HIS 101 United States History I	4.5
MAT 122 Intermediate Algebra	4.5
PSY 101 General Psychology	4.5
SOC 101 Introduction to Sociology	4.5
SPE 110 Public Speaking	4.5
HUM 100 Seminar in Current Concepts	1
Required Courses in Industrial Technology Education	**57**
AUT 101 Introduction to Auto Repair and Minor Service	4
CST 101 Introduction to Construction Technology	3
CST 109 Print Reading and Sketching-Residential	3
CST 131 Basic Cabinet Construction	4
DRT 100 Introduction to Drafting	4
DRT 104 Drafting Techniques	4
DRT 250 AutoCAD I	4
GAT 105 Introduction to Type and Paste-up Preparation	4
IDM 109 Basic Electricity	6
IDM 205 Small Engine Repair	3
PMT 101 Introduction to Machine Technology	6
PMT 103 Drill Presses, Horizontal and Vertical Saws	3
WEL 103 Industrial Cutting Process	3
WEL 111 Shielded Metal Arc: Flat/Horizontal Position	3
WEL 131 Gas Metal Arc Welding I	3
Total Required Hours	**100**

For more information call:
(402) 449-8400 or in Nebraska toll free 1-800-228-9553.

METROPOLITAN
COMMUNITY COLLEGE

8/93

LETTER OF AGREEMENT
FOR THE
TRANSFER OF ACADEMIC CREDIT
FROM
CENTRAL COMMUNITY COLLEGE
TO THE
UNIVERSITY OF NEBRASKA-LINCOLN

Central Community College and the Teachers College of the University of Nebraska-Lincoln believe that cooperative programs benefit both students and the respective institution. Therefore, the Teachers College of the University of Nebraska-Lincoln agrees that if a student satisfactory completes an Associate of Art in Education Degree from Central Community College, as outlined in the attached planning guide, he/she will be admitted to the University of Nebraska-Lincoln to pursue a Bachelor of Science Degree in Education with a Major in Industrial Technology Education.

Upon completion of the Associate of Art in Education Degree from Central Community College, the student will have met Teachers College requirements for:

30 semester hours in general education courses
30 semester hours in industrial technology education courses
4 semester hours in professional education courses

Students must complete all post-associate coursework at the University of Nebraska-Lincoln in accordance with the academic Standards of Progress defined in the University of Nebraska-Lincoln catalog. Specific courses may have prerequisites. Students are advised to meet with an advisor at the University of Nebraska-Lincoln to complete an individual program assessment.

If it is deemed necessary, after an evaluation of this transfer agreement, either institution may withdraw from this cooperative venture without penalty by notifying the other institution in writing. The date of withdrawal becomes effective after all currently enrolled students have completed their program of study.

James O'Hanlon, Ed.D
Dean of Teachers College
University of Nebraska-Lincoln

Date: Nov. 16 1994

Dennis A. Tyson, Ph.D.
College Vice President
for Educational Services
Central Community College

Date: December 7, 1994

CENTRAL COMMUNITY COLLEGE
ASSOCIATE OF ART IN EDUCATION
(Industrial Technology Education)

Required & Elective Courses: 34 Hours

Education Courses (4 hours)

CCC	UNL	
Edu 111: Introduction to Education	Educ 131: Found. of Education	3
Edu 150: Pre-Student Teaching	Ed Psy 297: Practicum Exp.	1

Industrial Technology Courses (Select 30 hours from the following)

CCC	UNL	
AuT 125: Introduction to Automotive	VAE 203: Automotive	4
AuT 130: Basic Engine	VAE 203: Small Engines	2
CsT 130: Carpentry Tools & Machines	VAE 104: Basic Woodworking	3
CsT 136: Building Layout	VAE 242: Construction	2
Drf 141: Basic Drafting I	VAE 101: Mechanical Drafting	4
Drf 160: Basic Architectural Drafting	VAE 101: Architectural Drafting	4
Drf 256: Basic CAD Operations	VAE 101: CAD	2
Elc 124: Electrical Theory	VAE 201: Electronics I	3
Elc 126: Concepts of Electronics	VAE 201: Electronics II	3
OR *		
Eln 137: Concepts of Electronics I	VAE 201: Electronics I	3
Eln 138: Concepts of Electronics II	VAE 201: Electronics II	3
Mfg 150: Maintenance, Tools & Mach.	VAE 204: Machine Shop	4
Mfg 205: Introduction to CIM	VAE 246: Modern Industries	3
Mfg 211: Manufacturing Processes	VAE 109: Metals & Plastics	3
Wld 130: Oxyacetylene Welding	VAE 202: OA Welding	3
Wld 140: Shield Metal Arc Welding	VAE 202: ARC Welding	3
OR *		
Mfg 140: Oxy-Acetylene Welding	VAE 202: OA Welding	3
Mfg 142: Gas Metal Arc Welding	VAE 202: ARC Welding	3

* Students can select either set of electronics courses or welding courses, however students should not choose one course from each set.

General Education Courses: 30 Hours

CCC	UNL	
I. Communications (6 hours)		
Com 121: Written Com. I	Eng 150: Composition I	3
Com 122: Written Com. II	Eng 151: Composition II	3
II. Humanities, Social & behavioral Sciences (12 hours)		
B. Literature		
Fpa 237: Contemporary Literature	Literature	3
C. History		
Soc 231: US History I	His 201: Am. History, pre 1877	3
Soc 232: US History II	His 202: Am. History, post 1877	3
F. Psychology		
Psy 121: Gen. Psychology	Psych 181: Gen. Psychology	3
III. Mathematics & Science (12 hours)		
Mth 137: College Algebra	Math 101: College Algebra	3
Bio 141: Gen. Biology	Bio S/L 101: Gen. Biology	4
Phy 161: El. of Physics I	Phys 141: El. Gen. Physics	5

TOTAL HOURS REQUIRED = 64